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Research Report 1531

Analysis of U.S. Army Enlisted Military Occupational Specialties (MOS) for Rapid Train-up Program (RTUP) Application

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U.S. Army Research Institute

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U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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Fourteen U.S. Army service schools participated in a Training and Doctrine Command (TRADOC) sponsored research effort to identify U.S. Army Enlisted Military Occupational Specialties (MOS) suitable for training Individual Ready Reserve (IRR) soldiers using Rapid Train-up Program (RTUP) methods. The objectives of the research were to determine (a) which tasks at skill level 1 for each MOS were highly critical for combat; (b) which highly critical combat tasks were suitable for training IRR soldiers in an RTUP using a procedure guide, training guide, or no training materials; and (c) the average time required to provide refresher training to standard using a training guide. Data obtained from service school subject matter experts (SMEs) indicated that 88 of 141 MOS analyzed were suitable for RTUP training. Moreover, 68 of these MOS could be refresher trained using training guides during a 3-day time frame being considered by the U.S. Army Training Board (USATB) for conducting an RTUP program.

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Measuring Tank Gunnery Proficiency

FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Field Unit at Fort Knox conducts research and development designed to maximize training readiness. This research investigated the suitability of using Rapid Train-up Program (RTUP) methods to train Individual Ready Reserve (IRR) soldiers called to active military duty in the event of mobilization. RTUP methods use procedure guides or training guides to provide refresher training for highly critical combat tasks within the enlisted U.S. Army military occupational specialty (MOS) classification structure. The methods are based on recognition of the fact that tasks that are moderately easy to learn may be refreshed or relearned quickly, while other tasks that are difficult to learn or error prone should not be performed by memory alone.

This report presents the consensus judgments of subject matter experts (SMEs) from 14 U.S. Army service schools regarding RTUP methods. For each enlisted MOS, the report identifies (a) skill level 1 tasks considered highly critical for combat, (b) highly critical combat tasks suitable for an RTUP using a procedure guide, (c) highly critical combat tasks suitable for an RTUP using a training guide, (d) estimates of average time to train tasks to standard using a training guide, and (e) highly critical combat tasks that should be part of RTUP but do not require training materials.

The research was conducted by the ARI Fort Knox Field Unit, Fort Knox, Kentucky. The ARI research effort was prompted by a request for Technical Advisory Service (TAS) by the Deputy Commanding General for Training (DCGT) at the Training and Doctrine Command (TRADOC), together with a request by the President, U.S. Army Training Board (USATB).

The research findings have been briefed to the President, U.S. Army Training Board, and advance copies of the report were provided for review. The findings will be used to supplement information being gathered in other TRADOC efforts to develop an IRR training strategy, and in formulating requirements for IRR mobilization training.

EDGAR M. JOHNSON
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ANALYSIS OF U.S. ARMY ENLISTED MILITARY OCCUPATIONAL SPECIALTIES (MOS) FOR RAPID TRAIN-UP PROGRAM (RTUP) APPLICATION

EXECUTIVE SUMMARY

Requirement:

This research identifies U.S. Army Enlisted Military Occupational Specialties (MOS) suitable for training Individual Ready Reserve (IRR) soldiers using Rapid Train-up Program (RTUP) methods. The specific objectives of the research were to determine (a) which tasks at skill level 1 for each MOS were highly critical for combat; (b) which highly critical combat tasks were suitable for training IRR soldiers in an RTUP using a procedure guide, a training guide, or no training materials; and (c) the average time needed to provide refresher training of IRR soldiers on each highly critical combat task using a training guide.

Procedure:

Fourteen U.S. Army service schools were formally asked by the Deputy Commanding General for Training (DCGT), Training and Doctrine Command (TRADOC), to fully cooperate with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Fort Knox Field Unit, in conducting the detailed analysis. The service schools were directed to provide ARI with a point of contact (POC), three subject matter experts (SMEs) for each MOS for which they were the proponent, and requested literature. A memorandum presenting the purpose of the research, background information, specific requirements to be met by the proponent schools, and detailed instructions with examples to accomplish the requirements was prepared and forwarded by ARI to each POC. MOS training data were collected by the service schools and submitted to ARI for compilation and analysis. Follow-up communications with the service schools were initiated as necessary to ensure completeness, accuracy, and timely reporting of the data.

Findings:

The 14 U.S. Army service schools surveyed by ARI reported proponency for 179 enlisted MOS. The data provided by SMEs representing the service schools on 142 of those MOS (79.3%) indicated that 103 (72.5%) were suitable for training IRR soldiers using RTUP methods. Analysis of SMEs' estimations of time required to train highly critical combat tasks using a training guide indicated that 76 (73.8%) of these MOS could be trained during the time frame being considered by the USATB for conducting an RTUP, a total of 3 days with 10-12 hours per day.

Utilization of Findings:

The results of this research identify enlisted U.S. Army MOS considered suitable for RTUP training of IRR soldiers in the event of mobilization. These results will be used to supplement ongoing efforts within TRADOC to develop an IRR training strategy and to formulate requirements for IRR mobilization training. Given the current training delivery technology and that which will become available in the near future, it should be possible to develop an automated system that can diagnose individual soldier skill level proficiency and prescribe training to the level required for any given job. As such, the research findings reported herein provide an important data base to guide future research and pilot feasibility tests on RTUP applications of IRR personnel to force readiness.

ANALYSIS OF U.S. ARMY ENLISTED MILITARY OCCUPATIONAL SPECIALTIES (MOS) FOR RAPID TRAIN-UP (RTUP) APPLICATION

CONTENTS

Page

LIST OF TABLES

ANALYSIS OF U.S. ARMY ENLISTED MILITARY OCCUPATIONAL SPECIALTIES (MOS) FOR RAPID TRAIN-UP PROGRAM (RTUP) APPLICATION

INTRODUCTION

The U.S. Army Training and Doctrine Command (TRADOC), given the ongoing reductions in funds available for defense, is in the process of developing an Individual Ready Reserve (IRR) training strategy and in formulating requirements for IRR mobilization training. These efforts are intended to maximize the combat effectiveness of IRR personnel in the event of mobilization, while minimizing the costs of preparing IRR soldiers for combat.

This report presents consensus judgments of subject matter experts (SMEs) selected by the U.S. Army service schools for each of the U.S. Army enlisted Military Occupational Specialties (MOSs). The SMEs judgments were obtained on the suitability of training IRR soldiers in highly critical combat tasks following a Rapid Train-up Program (RTUP) methodology. Points of contact (POCs) established with each service school were provided with an ARI memorandum that presented specific requirements and detailed instructions for conducting a detailed analysis of the proponent's MOSs. SMEs judgments were collected by the service school's POCs and forwarded to ARI for compilation and analysis. Additional information on individual MOS, skill level 1 task training, and data collection efforts was supplied by the POCs, as were personal concerns expressed on the need for the development of RTUP training materials.

The specific objectives of the research were to determine (a) tasks at skill level 1 for each MOS that were highly critical for combat; (b) which highly critical combat tasks were suitable for training IRR soldiers in a RTUP using a procedure guide, a training guide, or no training materials; and (c) the average time needed to provide refresher training to standard for IRR soldiers on each highly critical combat task using a training guide.

This report of U.S. Army enlisted MOS suitable for training following a RTUP methodology was initiated at the request of the Deputy Commanding General for Training (DCGT), Training and Doctrine Command (TRADOC), and the President, U.S. Army Training Board (USATB).

BACKGROUND

IRR Mobilization

The most critical demand for military personnel to fill and sustain the force will be during the first 120 days of war. During this time period the mobilization base can only produce a small percentage of the personnel needed to meet force requirements. Consequently, force requirements during this period must be met from existing manpower resources. These resources are personnel in the transient, trainee, holdee, and student accounts, personnel assigned to temporary duty assignment (TDA) positions which will be abolished at mobilization, retirees who can fill non-deploying positions to release other personnel to fill critical wartime positions, and members of the IRR.

In 1984 the military service obligation (MSO) for enlisted soldiers was extended from six to eight years. This extension in MSO has resulted in a significant increase in the number of soldiers in the IRR force. Typically, the average age of enlisted soldiers when released from active duty is 21 years, with from two to four years still obligated by law in the reserve component. When it is considered that these personnel were not only trained to standard but that some received reinforcement training as well as training and experience at advanced skill levels during an active duty tour, this pool of prior service personnel in the IRR provides a substantial means of meeting urgent force requirements during the early phase of mobilization.

Upon mobilization many IRR soldiers will have been away from active military duty for a year or more. These soldiers will require refresher training and perhaps transition training on new Army systems. Based on data summarized in a recent RAND report (Bodilly, Fernandez, Kimbrough, & Purnell, 1986), 85% of the Army members of the IRR have been trained only to skill level 1. While there is little data on skill decay, it is known that an individual who has been previously trained to standard, can regain that standard with far less training than an untrained individual. However, given that the great majority of IRR soldiers have never been trained to high levels of mastery in their warfighting skills, with a consequent loss of knowledge and skill during the period between active military duty and call-up, a training strategy must be developed to ensure that the best use is made of IRR personnel at mobilization. Furthermore, giving expected limits on defense spending, the training strategy developed for the IRR must be cost-effective.

Rapid Train-up Program

With an urgent requirement for replacement personnel to meet force requirements in battlefield units, the expectation that units can train replacement personnel to the required skill levels, while simultaneously performing numerous other tasks in preparation for deployment, places another requirement on the units that they are ill prepared to meet. It becomes imperative, therefore, that an IRR training strategy be developed that can readily determine the training needs of individual IRR soldiers and provide only that training essential for combat so that time and other critical resources can be conserved.

One of several alternative approaches that merits attention in the development of an overall IRR training strategy is a Rapid Train-up Program (RTUP). The RTUP approach is based on recognition of the fact that tasks that are moderately easy to learn may be refreshed or relearned quickly, while other tasks that may be so difficult to learn or error prone that they should not be performed by memory alone. The RTUP approach concentrates on the highly critical tasks that must be taught for safety and rapid availability in combat, as compared to tasks that may be reacquired gradually by on-the-job training (OJT).

In response to a need for new Reserve Component (RC) training, a Tank Crewman Skills Training (TCST) Program was developed for operating and maintaining the M48A5 tank (Harris, Osborn, & Boldovici, 1977). This program consisted of performance tests and training modules addressing functional groups of 105 crewman tasks identified as critical to gunnery performance on Table VIII and related crew drills and skills judged important by the Armor School. Designed around the time, terrain, and resource constraints that typify RC training, the TCST was performance-based, criterion-referenced and individually managed. Training Extension Course (TEC) lessons and existing training devices, along with the specifications for other devices and material, were used to implement training.

Five training studies were conducted in an attempt to evaluate variation of TCST in terms of training effectiveness and soldier acceptance (Obrien, Crum, Healy, Harris, & Osborn, 1977) Two of the five studies produced positive results. In one, the training center active and reserve mobilization train-up, TCST produced soldier skill levels and opinions superior to those resulting from two alternative programs. In the other, the accelerated tank crew replacement training, TCST was used successfully in rapidly preparing non-armor soldiers to fill in as gunners and loaders on a gunnery qualification test--a Table VIII test in which the crews with replacements performed as well as experienced intact crews.

Rapid Train-up Methodology

The RTUP methodology being considered by TRADOC consists of two types of training materials previously developed by ARI for Armor crewmembers: procedure guides and training guides (Morrison, 1985; Kraemer, Anderson, Kristiansen, & Jobe, 1985). A procedure guide is a job performance aid designed to help experienced soldiers -- soldiers with previous training on tasks in their MOS -- to remember and perform a number of lengthy and complex task procedures. A procedure guide can be used by the soldier for self-paced review, and provides a compact, readily available reference source whenever needed. The procedure guide developed by ARI abbreviates task information and presents it in an innovative algorithmic format similar to a flow chart diagram. At each decision point, a soldier is asked a question concerning the phase of operation, environmental conditions, status of lights or switches, etc. Based on the soldier's response, the appropriate succeeding steps are identified. An example of an ARI procedure guide is presented in Enclosure 1, Appendix A.

A comparative evaluation of procedure guides developed for the M1 tank, the tank operator's technical manual (TM), and a TM checklist used during task performance was conducted by ARI (Goldberg, 1983). Overall results indicated that (a) performance using the procedure guides was as accurate as performance using the TM or the checklist, (b) time required to locate procedures in the procedure guides was less than was required by the TM and not different from the time required by the checklist, and (c) soldiers' opinions indicated that the procedure guides would be well received by M1 crewmembers.

A training guide is a compact, ready-made instructional module or unit that provides an instructor with a best method for training and evaluating a particular job task. The training guide developed by ARI is formatted onto a single page. The front page or side contains a brief description of the training task, a training pretest procedure, a training decision guide and prescription, and a training progress procedure. The backside of the training guide contains a training and evaluation checklist. When demonstrating a task, the checklist can be used by an instructor as a reminder of the task procedure. When directing the practice of a task, it can be used by the instructor to guide initial task performance, correct errors, and check training progress. An example of an ARI training guide is presented in Enclosure 2, Appendix A.

A concept evaluation of training guides developed in an RTUP for M60A3 armor force mobilization was conducted with master gunners in the 5/73d Armor Battalion, 194th Armor Brigade. The overall results were positive, as briefed by the soldiers to both ARI and Directorate of Training and Doctrine (DOTD), U.S. Army Armor School (USAARMS), Fort Knox, KY. Similar results also were reported from the 1-73d armor battalion in training M60A3 tank crewmen assigned to Opposing Forces (OPFOR) at the National Training Center, and 2/9th Cav, 24th Infantry Division, Fort

Stewart, Georgia. Presently, the program is being used by the Combined Arms Team, Readiness Group, Fort Knox, KY in the training of M60A3 RC and Army National Guard units.

An additional part of a RTUP that needs to be mentioned are those highly critical combat tasks that are quite simple to perform and do not require the use of either a procedure guide or training guide. For example, the task of identifying 120mm main gun ammunition for the M1 Abrams tank can be easily checked and refresher trained by the soldier's immediate supervisor (tank commander) when the actual tank's ammunition is available. Likewise, a supervisor can easily check and refresher train a task that requires a soldier to use various types of tools i.e., a torque wrench, a power saw, drill, etc, when the actual equipment is available.

RTUPs may be designed to be administered as self-paced individualized instruction using Training Extension Courses (TECs), Electronic Information Delivery Systems (EIDS), or paper-and-pencil; or as instructor-led task training. Training may be designed for administration in the Continental United States (CONUS) training centers or in Active Component (AC) and Reserve Component (RC) units.

METHOD

To accomplish the specific objectives of this research effort, a message (LTG Crosby, 1988) was sent from the Commander TRADOC to the U.S Army service schools directing them to fully cooperate in the research by providing ARI with a point of contact (POC), requested literature, and making subject matter experts (SMEs) available as necessary. Direct coordination between ARI and the service schools was authorized. Specific requirements and information concerning the project were to be developed and provided to the service schools by ARI.

A memorandum was prepared and forwarded to the POCs provided by each U.S. Army service school. This ARI memorandum presented (a) the purpose of the research, (b) background information, to include a profile of the IRR soldier, description of the RTUP methodology, and examples of an ARI procedure guide and training guide, (c) specific requirements to be met by the service schools, in the form of products, and (d) detailed instructions on how to accomplish each of the specific requirements. A copy of the ARI memorandum is presented in Appendix A.

For each enlisted MOS, SMEs selected by the service schools were instructed to individually then collectively identify (a) skill level 1 tasks considered highly critical for combat, (b) highly critical combat tasks suitable for a RTUP using a procedure guide, (c) highly critical combat tasks suitable for a RTUP using a training guide, (d) estimates of average time to train each task to standard using a training guide, and (e) highly critical combat tasks that should be part of a RTUP but do not require training materials.

SMEs estimates of average time needed to refresher train highly critical combat tasks using a procedure guide were not requested as part of the research. Also not requested were the types of alternative training material needed to train those highly critical combat tasks that were judged not suitable for training following the RTUP methodology.

In order for an MOS to be identified as suitable for RTUP application, all of the highly critical combat tasks identified for the MOS had to be judged trainable using either a procedure guide, training guide, or requiring no training material i.e., the instructor led training using only the operational equipment or an available facsimile. In order for an MOS that was judged suitable for RTUP application to be a candidate for a RTUP being considered by the USATB, the estimated time needed to provide refresher training of the highly critical combat tasks using a training guide had to be accomplished during 36 hours, i.e., three days with 10-12 hours per day.

Data furnished by the U.S. Army service schools were compiled and analyzed by ARI. MOSs excluded for RTUP analysis by the service schools were those that (a) began at skill level 2, (b) were considered too complex to be trained within the time period normally available for conducting a RTUP, (c) did not have tasks considered highly critical for combat, (d) required semi-annual re-certification, (e) were scheduled for deletion in the near future, (f) were new or in the development stage and the critical task list had not been developed, or (g) were considered communications security (COMSEC) MOSs. Also, by joint agreement between the USATB and ARI, the skill level 1 tasks identified in the Soldier's Manual of Common Tasks (STP 21-1-SMCT, October 1987) were not analyzed for RTUP application.

Except as noted in the results section of this report, missing or incomplete data were routinely recovered by direct follow-up communications between ARI and the POCs. Also, data that was not collected in accordance with the detailed instructions presented in the ARI memorandum were obtained by having the service schools repeat those parts of the analysis required to meet the requirements.

Reasons that SMEs judged particular tasks to be unsuitable for the RTUP methodology, as well as the estimated times to provide refresher training for tasks, could not be ascertained from the data collected for many MOSs. Those MOSs and tasks judged highly critical for combat but that require training materials other than a procedure guide or training guide should be investigated further to determine the basis for the SMEs decision. Several of the MOSs might be included in the RTUP approach if other low-cost media are suitable for training these tasks. A similar investigation should be made of SMEs time estimates. Many IRR soldiers will pass the pretest portion of the task training guide and not require additional training. For those who fail, many will retain much of the knowledge and

skill that only minimal refresher training will be needed to perform the task to standard.

RESULTS

The detailed results of the RTUP study are presented in the following paragraphs by each U.S Army service school. A list of the 14 U.S. Army service schools and the POCs designated to ARI will be presented in Appendix B. Data provided by each of the service schools are reported separately in ARI Fort Knox Field Unit Working Paper FKFU WP 89-1 (Kraemer, 1988).

U.S. Army Air Defense Artillery School

The U.S. Army Air Defense Artillery School (USAADASCH) reported proponency for the following 14 MOSs:

MOS	TITLE
16D	HAWK Missile Crewmember
16E	HAWK Fire Control Crewmember
16J	Defense Acquisition Radar Operator
16P	CHAPARRAL Crewmember
16R	VULCAN Crewmember
16S	Man Portable Air Defense System (MANPADS) Crewmember
16T	PATRIOT Missile Crewmember
24C	HAWK Firing Section Mechanic
24G	HAWK Information Coordination Central Mechanic
24L	HAWK Launcher and Mechanical Systems Repairer
24M	VULCAN System Mechanic
24MX7	FAAR Organizational Maintenance (ASI X7)
24N	CHAPARRAL System Mechanic
24T	PATRIOT Operator and System Mechanic

MOS data provided by the USAADASCH are reported in Table 1. As indicated (**), 8 of the 14 MOSs (57.1%) were judged suitable for training IRR soldiers using the RTUP methodology, and for all 8 MOSs the total time for training using the training guides was less than the three day time frame being considered by the USATB for conducting a RTUP.

For the remaining six MOSs, two MOSs (MOS 24C/G) were considered by the USAADASCH as too complex to be trained within the time period normally available for conducting a RTUP. For three other MOSs (MOS 16D/P/S), only one or two of the tasks judged highly critical for combat were judged not suitable for RTUP using a procedure guide or training guide. Why these tasks were not judged suitable following the RTUP methodology remains to be determined. For the remaining MOS (MOS 24L), the SMEs data suggests that some alternative training method or materials are needed to train the majority of highly critical combat tasks.

Table 1

SME Judgments on Tasks in Air Defense Artillery MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
16D	25	10	3	6	0	36.0
16E**	54	27	25	2	0	3.0
16J**	34	23	12	9	2	15.0
16P	26	12	6	4	0	32.0
16R**	25	12	7	4	1	24.5
16S	33	24	16	6	0	21.5
16T**	113	40	3	32	5	33.0
24C	39	39	0	0	0	0.0
24G	43	33	0	0	0	0.0
24L	60	48	5	5	0	28.0
24M**	36	28	28	0	0	0.0
24MX7**	24	13	9	4	0	9.0
24N**	107	27	27	0	0	0.0
24T**	244	46	27	18	1	34.0

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

U.S. Army Armor School

The U.S Army Armor School (USAARMS) reported proponency for the following three MOSs:

MOS	TITLE
19D	Cavalry Scout
19E	M48-M60 Armor Crewman
19K	M1 Armor Crewman

MOS data provided by the USAARMS are reported in Table 2. As shown by the single asterisk (*), all three MOSs (100%) were judged suitable for RTUP training by the SMEs. However, the total training time for all three MOSs using training guides exceeded the three day time frame being considered by the USATB for conducting a RTUP.

Since each of the USAARMS MOSs contains more than one job position (e.g., tank driver, loader), the USATB might want to consider conducting a more detailed analysis of the MOSs. In doing so, it might be found that all 3 MOSs could be trained during the RTUP proposed time frame if the training is conducted concurrently by job position.

Table 2

SME Judgment on Tasks in Armor MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
19D*	186	174	9	151	14	125.9
19E*	142	121	20	89	11	55.4
19K*	136	119	31	78	10	46.7

*Suitable for RTUP application.

U.S. Army Aviation Center

The U.S. Army Aviation Center (USAAVNC) is located at Fort Rucker, Alabama. The USAAVNC reported proponency for the following five MOSs:

MOS	TITLE
93B	Aeroscout Observer
93C	Air Traffic Control (ATC) Operator
93P	Flight Operations Coordinator
67N	Utility Helicopter Repairer
67V	Observation/Scout Helicopter Repairer.

MOS data provided by the USAAVNC are reported in Table 3. As indicated (**), all five MOSs (100%) were judged suitable for RTUP training, and all five MOSs were judged suitable using training guides within the USATB time frame for conducting a RTUP.

For MOS 93B, the USAAVNC indicated that upon completion of this training, IRR soldiers will be given day and night vision goggle flight evaluations in their respective aircraft. All training thereafter will be tailored to the individual, and geared to improvement in the areas where a weakness was displayed. For MOS 93C, where the SMEs indicated that no training material was required, the USAAVNC indicated that all tasks will require the use of operational equipment. For MOS 93P, the USAAVNC indicated that the exportable training material they have provided to the Reserve Component (RC) should be used for this RTUP, with emphasis on pretests. If IRR soldier passes pretest, qualification should be presumed. Also, the USAAVNC indicated that a portable training package for one of the tasks is currently being developed and should be available in FY 89.

Table 3

SME Judgments on Tasks in Aviation MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
93B**	84	15	0	15	0	16.0
93C**	66	6	0	0	6	0.0
93P**	43	5	0	0	5	0.0
67N**	70	3	0	3	0	32.0
67V**	63	3	0	3	0	32.0

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

U.S. Army Chaplain Center and School

The U.S. Army Chaplain Center and School (USACC&S) reported proponency for one MOS: 71M, Chaplain Assistant.

The USACC&S data reported presents the consensus judgments of a group of SMEs for the MOS. The exact number of SMEs within the group and the individual SMEs judgments on the tasks were not provided by USACC&S. The USACC&S also indicated that the task list was tailored previously for the Reserve Component Reclassification Course which eliminated all garrison-only peacetime tasks but trains all post mobilization chaplain assistant tasks.

As shown in Table 4, MOS 71M was judged not suitable for RTUP application. Although the estimated amount of time needed to train highly critical combat tasks using a training guide is within the USATB time frame for conducting a RTUP, the training time for two of the tasks was not provided.

Table 4

SME Judgments on Tasks in Chaplain MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
71M	56	56	16	13	0	31.5

U.S. Army Chemical School

The U.S. Army Chemical School (USACMLS) reported proponency for one MOS: 54B, Chemical Operations Specialist.

MOS data provided by the USACMLS are reported in Table 5. As shown, the SMEs reported that 95 of the 97 tasks judged highly critical for combat could be trained using either a procedure guide or training guide. Since only two of the highly critical combat tasks could not be trained following the RTUP methodology, a closer examination of the MOS tasks is needed. However, given the approximately 75 hours estimated by the SMEs to train these tasks using a training guide, the MOS does not meet the three day time frame being considered by USATB for conducting a RTUP.

Table 5

SME Judgments on Tasks in Chemical MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
54B	97	97	2	73	20	74.5

U.S. Army Engineer School

The U.S. Army Engineer School (USAES) reported proponency for the following 21 MOSs:

MOS	TITLE
00B	Diver
12B	Combat Engineer
12C	Bridge Crewmember
12F	Engineer Tracked Vehicle Crewman
51B	Carpentry and Masonry Specialist
51G	Materials Quality Specialist
51K	Plumber
51R	Interior Electrician
51M	Firefighter
52G	Transmission and Distribution Specialist
62B	Construction Equipment Repairer
62G	Quarrying Specialist
62H	Concrete and Asphalt Equipment Operator
62J	General Construction Equipment Operator
81B	Technical Drafting Specialist
81C	Cartographer
81Q	Terrain Analyst
82B	Construction Surveyor
82D	Topographic Surveyor
83E	Photo and Layout Specialist
83F	Printing and Bindery Specialist

The first 14 MOSs listed above were analyzed by three SMEs at Fort Leonard Wood. Two of these MOSs, MOS 00B (Diver) and MOS 52G (Transmission and Distribution Specialist), were considered not applicable for a RTUP. The reasons given were (a) a MOS 00B (diver) must be recertified every six months and (b) MOS 52G (Transmission and Distribution Specialist) is being deleted in the near future. The last seven MOSs shown above (MOS 81B/C/Q, 82B/D, and 83E/F) were analyzed by three SMEs from Fort Belvoir, Virginia.

MOS data provided by USAES are reported in Table 6. As indicated (*), 18 of the 19 MOSs (94.7%) were judged suitable for training following the RTUP methodology. This included all 12 of the MOSs analyzed by SMEs at Fort Leonard Wood and 6 of the 7 MOSs analyzed by SMEs at Fort Belvoir. The MOS judged unsuitable for RTUP application was 83F (Printing and Bindery Specialist). As reported by the POC from Fort Belvoir, none of the 17 tasks listed on the data sheet submitted to ARI for this MOS were highly critical for combat or suitable for training following the RTUP methodology.

Table 6

SME Judgments on Tasks in Engineer MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
12B**	43	31	8	23	0	28.4
12C**	50	39	25	14	0	21.5
12F**	80	72	50	22	0	32.0
51B**	34	34	21	13	0	13.0
51G**	37	37	29	8	0	17.0
51K**	36	36	23	13	0	13.0
51R**	27	27	8	19	0	19.0
51M**	24	19	11	8	0	12.0
62B*	60	48	11	37	0	38.5
62G**	23	21	13	8	0	9.0
62H**	20	14	12	2	0	2.0
62J**	30	27	8	19	0	20.5
81B**	17	10	10	0	0	0.0
81C**	15	12	12	0	0	10.0
81Q**	52	41	41	0	0	0.0
82B*	29	29	0	29	0	48.0
82D**	50	23	9	14	0	16.0
83E**	23	8	0	8	0	8.0
83F	41	19	1	2	0	3.0

*Suitable for RTUP application.

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

As also indicated (**) in Table 6, 16 of these 16 MOSs were also judged suitable for training with training guides during the USATB time frame for conducting a RTUP. Since the time data for the two MOSs that exceeded the USATB time frame (MOS 62B, Construction Equipment Repairer; MOS 82B, Construction Surveyor) were close to the 36 hour cutoff, these MOSs might be given closer examination.

U.S. Army Field Artillery School

The U.S. Army Field Artillery School (USAFAS) reported proponency for the following 13 MOSs:

MOS	TITLE
13B	Cannon Crewmember
13C	TACFIRE Operations Specialist
13E	Cannon Fire Direction Specialist
13F	Fire Support Specialist
13M	Multiple Launch Rocket System (MLRS) Crewmember
13N	LANCE Crewmember
13P	Multiple Launch Rocket System/LANCE Operations/ Fire Direction Specialist
13R	Field Artillery Firefinder Radar Operator
39C	Target Acquisition Surveillance Radar Repairer
39L	Field Artillery (FA) Digital Systems Repairer
39Y	Field Artillery Tactical Fire Directions Systems Repairer
82C	Field Artillery Surveyor
93F	Field Artillery Meteorological Crewmember

MOS data provided by the USAFAS are reported in Table 7. All skill level 1 tasks were judged by the SMEs as highly critical for combat. As indicated (*), 8 of the 13 MOSs (61.5%) were judged suitable for RTUP application. Except for one task, MOS 13P also would have been suitable for RTUP. As for the 4 remaining MOSs, the majority of tasks within each MOS could be trained using either a procedure guide or training guide. However, several remaining tasks would require alternative training solutions or more extensive training.

As to the 8 MOSs judged suitable for RTUP application, 4 of the MOSs (MOSs 31M/N, 82C, 93F) were also judged suitable for training during the three day time frame being considered by USATB for conducting a RTUP.

Table 7

SME Judgments on Tasks in Field Artillery MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
13B	76	76	28	22	0	10.7
13C*	32	32	0	32	0	37.5
13E	51	51	42	2	0	2.5
13F*	71	71	69a	55a	0	46.7
13M**	48	48	34	14	0	8.1
13N**	80	80	39	41	0	24.5
13P	78	78	30	47	0	104.4
13R	78	78	69	0	0	0.0
39C	77	77	17	53	0	174.0
39L*	29	29	10	19	0	73.4
39Y*	63	63	18	45	0	177.1
82C**	52	52	48	4	0	4.0
93F**	37	37	24a	20a	2	24.5

*Suitable for RTUP application.

**Suitable for RTUP application and can be conducted during a three day time frame with 10-12 hours per day.

aTasks can be trained using both a procedure guide and training guide.

U.S. Army Infantry School

The U.S. Army Infantry School (USAIS) reported proponency for the following 4 MOSs:

MOS	TITLE
11B	Infantryman
11C	Indirect Fire Infantry
11H	Heavy Antiarmor Weapons Infantryman
11M	Fighting Vehicle Infantryman

MOS data provided by the USAIS are reported in Table 8. As indicated (**), only 1 of the 4 MOSs (MOS 11M) was judged suitable for RTUP training. Moreover, this MOS was judged suitable for training using training guides during the three day time frame for conducting a RTUP.

In examining the data, it should be noted that the USAIS considered all skill level 1 tasks highly critical for combat. Whether a prioritized list of fewer highly critical combat tasks would have changed the results remains uncertain. Secondly, the SMEs who judged the suitability of the MOSs for RTUP application considered the great majority of the highly critical combat tasks trainable using either a procedure guide or training guide.

Table 8

SME Judgments on Tasks in Infantry MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
11B	193	193	34	145	10	110.2
11C	203	203	43	144	2	101.8
11H	181	181	36	127	0	80.4
11M**	191	191	57	102	32	25.4

**Suitable for RTUF and can be conducted during a three day time frame with 10-12 hours per day.

U.S. Army Intelligence Center and School

The U.S. Army Intelligence Center and School (USAIC&S) reported proponency for the following 19 MOSs:

MOS	TITLE
05D	Electronic Warfare/Signal Intelligence Emitter Identifier/Locator
05H	Electronic Warfare/Signal Intelligence Morse Interceptor
05K	Electronic Warfare/Signal Intelligence Non-Morse Interceptor
33M	Electronic Warfare/Intercept Strategic Systems Analyst and Command and Control Subsystems Repairer
33P	Electronic Warfare/Intercept Strategic Receiving Subsystems Repairer
33Q	Electronic Warfare/Intercept Strategic Processing and Storage Subsystems Repairer
33R	Electronic Warfare//Intercept Aviation Systems Repairer
33T	Electronic Warfare/Intercept Tactical Systems Repairer
33V	Electronic Warfare/Intercept Aerial Sensor Repairer
96B	Intelligence Analyst
96D	Imagery Analyst
96H	Aerial Intelligence Specialist
96R	Ground Surveillance Systems Operator
97B	Counterintelligence Agent
97E	Interrogator
97G	Counter Signals Intelligence Specialist
98C	Electronic Warfare/Signal Intelligence Analyst
98G	Electronic Warfare/Signal Intelligence voice Interceptor
98J	Electronic Warfare/Signal Intelligence Non-communications Interceptor

Twelve of the MOSs listed above (MOSs 05D/H/K, 33M/P/Q/R/T/V, 98C/G/J) were analyzed by three SMEs located at Fort Devens. One MOS (MOS 33M) was excluded for RTUP analysis because training in the MOS starts at skill level 2. Also, MOSs which contained classified tasks at a compartmented classification level (MOSs 05D-7, 05H-33, 98C-7, 98G-88, 98J-15) were not analyzed.

Eight of the MOSs listed above (MOSs 33V, 96B/D/H/R, 97B/E/G) were analyzed by three SMEs at Fort Huachuca. Data showing the number of skill level 1 tasks for these MOSs were not provided.

MOS data provided by the USAIC&S are reported in Table 9. As indicated (*), only 3 of the 18 MOSs (16.7%) were judged suitable for training with the RTUP methodology. As for the remaining MOSs, only 4 MOSs (MOSs 05D, 96B, 96H, 96R) were reported to have limited RTUP application.

For 4 MOSs (MOSs 05H, 33T, 96R, 98C), the SMEs indicated that training can be conducted using both a procedure guide and training guide.

Table 9

SME Judgments on Tasks in Intelligence MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
05D	15	5	3	1	0	TBD
05H*	47	8	8[a]	8[a]	0	TBD
05K	40	0	0	0	0	0.0
33P	24	15	0	0	0	0.0
33Q	19	10	0	0	0	0.0
33R	24	17	1	0	0	0.0
33T	41	36	4[a]	4[a]	0	TBD
33V	30	26	4	3	0	TBD
96B	TBD	25	11	10	0	25.8
96D	TBD	44	2	0	16	0.0
96H	TBD	47	10	0	21	0.0
96R	TBD	74	46[a]	46[a]	0	13.9
97B	TBD	28	0	0	0	0.0
97E	TBD	23	1	0	0	0.0
97G	TBD	10	2	0	0	0.0
98C*	107	100	100[a]	100[a]	0	TBD
98G	193	105	17	20	0	TBD
98J*	50	25	25	0	0	0.0

*Suitable for RTUP application.

[a]Tasks can be trained using both a procedure guide and training guide.

Without SME data from Fort Devens on the estimated amount of time needed to refresher train highly critical combat tasks using a training guide, it remains unknown whether the three MOSs judged suitable for RTUP application could be trained during the three day time frame for a RTUP.

U.S. Army Military Police School

The U.S. Army Military Police School (USAMPS) reported proponency for the following 3 MOSs:

MOS	TITLE
95C	Corrections NCO
95D	CID Special Agent
95B	Military Police

The USAMPS reported that training in two of these MOSs (95C and 95D) starts at skill level 2 and were excluded for RTUP analysis.

MOS data provided by the USAMPS are reported in Table 10. As indicated (**), MOS 95B was judged suitable for RTUP training, and given the SMEs estimate of approximately 18 hours to train the tasks using training guides, the MOS could be trained during the three day time frame for a RTUP.

Table 10

SME Judgments on Tasks in Military Police MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
95B**	118	63	39	24	0	17.5

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

U.S. Army Ordnance Center and School

The list of tasks used by the SMEs at USAOC&S for analyzing each MOS was a generic task list that is supported by an audit trail as required by TRADOC Regulation 350-7. The audit trail includes a crossmatch between item-specific critical tasks and generic tasks. As such, the actual number of skill level 1 tasks will be greater than that provided for each MOS. Except for MOS 63D for which the data was not provided, all administrative and general tasks identified in the critical task list for each MOS were excluded for analysis.

The U.S. Army Ordnance Center and School (USAOC&S) reported proponency for the following 25 MOSs:

MOS	TITLE
41C	Fire Control Instrument Repairer
44B	Metal Worker
44E	Machinist
45B	Small Arms Repairer
45D	Self-Propelled Field Artillery Turret Mechanic
45E	M1 ABRAMS Tank Turret Mechanic
45G	Fire Control System Repairer
45K	Tank Turret Repairer
45L	Artillery Repairer
45N	M60A1/A3 Tank Turret Mechanic
45T	BRADLEY Fighting Vehicle System Turret Mechanic
52C	Utilities Equipment Repairer
52D	Power Generation Equipment Repairer
52F	Turbine Engine Driven Generator Repairer
63B	Light Wheel Vehicle Mechanic
63D	Self-Propelled Field Artillery System Mechanic
63E	M1 ABRAMS Tank System Mechanic
63G	Fuel and Electrical System Repairer
63H	Track Vehicle Repairer
63J	Quartermaster and Chemical Equipment Repairer
63N	M60A1/A3 Tank System Mechanic
63S	Heavy Wheel Vehicle Mechanic
63T	BRADLEY Fighting Vehicle System Mechanic
63W	Wheel Vehicle Repairer
63Y	Track Vehicle Mechanic

MOS data provided by the USAOC&S are reported in Table 11. As indicated (*), all 25 MOSs (100%) were judged suitable for RTUP training. As further indicated (**), 24 of the 25 MOSs were also judged suitable for training with training guides during the three day time frame for a RTUP.

For six MOSs (MOSs 52D/F, 63E/G/H/S/W), SMEs indicated that training could be conducted using a procedure guide, training guide, or both.

Given the commonality of tasks in MOS 63H and MOS 63W, a closer examination of MOS 63W should be conducted to determine why the estimated time using training guides did not fall within the 36 hour limit for an RTUP.

Table 11

SME Judgments on Tasks in Ordnance MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
41C**	21	13	13	0	0	0.0
44B**	18	13	0	0	13	0.0
44E**	12	7	0	0	7	0.0
45B**	20	8	8	0	0	0.0
45D**	20	15	13	2	0	1.0
45E**	21	11	3	8	0	26.5
45G**	16	8	8	0	0	0.0
45K**	23	12	12	0	0	0.0
45L**	22	16	16	0	0	0.0
45N**	20	12	8	4	0	2.5
45T**	21	13	13	0	0	0.0
52C**	42	22	20	0	2	0.0
52D**	28	17	14[a]	9[a]	2	10.5
52F**	32	22	22[a]	12[a]	0	12.0
63B**	56	31	11	20	0	10.0
63D**	33	17	17	0	0	0.0
63E**	81	46	35[a]	13[a]	0	28.5
63G**	30	20	20[a]	13[a]	0	34.7
63H**	51	16	7[a]	10[a]	0	23.5
63J**	40	23	20	2	1	2.0
63N**	77	17	7	7	3	5.0
63S**	55	16	16[a]	1[a]	0	1.5
63T**	79	43	27	4	12	4.0
63W*	52	28	23[a]	23[a]	5	105.0
63Y**	57	17	8	9	0	5.4

*Suitable for RTUP application.

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

[a]Tasks can be trained using both a procedure guide or training guide.

U.S. Army Quartermaster School

MOS data provided by the USAQS are reported in Table 12. As indicated (*), 11 of the 13 MOSs (84.6%) were judged suitable for RTUP training. As also indicated (**), only 5 of the 11 MOSs were judged suitable for training using the training guides within the three day time frame being considered by the USATB for conducting a RTUP.

The U.S. Army Quartermaster School (USAQS) reported proponency for the following 13 MOSs:

MOS	TITLE
43E	Parachute Rigger
43M	Fabric Repair Specialist
57E	Laundry and Bath Specialist
57F	Graves Registration Specialist
76C	Equipment Records and Parts Specialist
76P	Materiel Control and Accounting Specialist
76V	Materiel Storage and Handling Specialist
76X	Subsistence Supply Specialist
76Y	Unit Supply Specialist
77F	Petroleum Supply Specialist
77L	Petroleum Laboratory Specialist
77W	Water Treatment Specialist
94B	Food Service Specialist

For three MOSs (MOSs 76X, 771/W), the SMEs indicated that either or both a procedure guide and training guide could be used to train the task.

Table 12

SME Judgments on Tasks in Quartermaster MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
43E*	55	55	24	24	7	211.5
43M**	53	53	37	16	0	36.2
57E*	34	34	22	12	0	95.0
57F**	30	30	24	6	0	24.9
76C**	39	39	35	4	0	15.2
76P	51	51	19	6	0	40.0
76V*	30	30	14	16	0	81.0
76X*	11	11	11[a]	11[a]	0	50.0
76Y*	26	26	17	9	0	40.8
77F**	60	60	60	0	0	00.0
77L	37	37	30[a]	11[a]	0	14.0
77W*	39	39	32[a]	38[a]	0	301.1
94B**	45	18	8	2	8	4.0

*Suitable for RTUP application.

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

aTasks can be trained using either or both a procedure guide and training guide.

U.S. Army Signal Center and Fort Gordon

The U.S. Army Signal Center and Fort Gordon (USASC&FG) reported proponency for the following 39 MOSs:

MOS	TITLE
26T	Radio/Television Systems Specialist
29E	Communications-Electronics Radio Repairer
29F	Fixed Communications Security Equipment Repairer
29G	Digital Communications Equipment Repairer
29H	Automatic Digital Message Switch Equipment (ADMSE) Repairer
29J	Teletypewriter Equipment Repairer
29M	Tactical Satellite/Microwave Repairer
29N	Telephone Central Office Repairer
29S	Field Communications Security Equipment Repairer
29V	Strategic Microwave Systems Repairer
29Y	Satellite Communications Equipment Repairer
31C	Single Channel Radio Operator
31D	MSE Transmission System Operator
31F	MSE Network Switching System Operator
31K	Combat Signaler
31L	Wire System Installer
31M	Multichannel Communications System Operator
31N	Tactical Circuit Controller
31Q	Tactical Satellite/Microwave Systems Operator
31V	Unit Level Communications Maintainer
32D	Communications Systems Circuit Controller
35H	Calibration Specialist
36L	Transportable Automatic Switching Systems Operator/Maintainer
36M	Switching Systems Operator
39B	Automatic Test Equipment Operator/Maintainer
39C	Target Acquisition/Surveillance Radar Repairer
39D	DAS3 Computer Systems Repairer
39E	Special Electronic Devices Repairer
39G	Automated communications Computer Systems Repairer
39L	Field Artillery Digital Systems Repairer
39T	Tactical Computer Systems Repairer
72E	Tactical Telecommunications Center Operator
72G	Automatic Data Telecommunications Operator
74D	Computer Machine Operator
74F	Programmer/Analyst
81E	Illustrator
84B	Still Photographic Specialist
84C	Motion Picture Specialist
84F	Audio/Television

The USASS&FG excluded 24 of the 39 MOSs listed above for RTUP analysis. The rationale and the MOSs excluded were:

a. MOSs did not have tasks considered highly critical for combat (MOS 26T, 29V/Y, 31N/32D, 35H, 39B/D/E/G, 74D/F, 81E, 84B/C/F).

b. MOSs are new or in the development stage and the critical task list has not been developed (MOS 31D/F).

c. COMSEC MOSs (MOS 29F/S).

d. MOSs are not taught at the Signal School (MOS 39C/L)

d. MOSs are scheduled for deletion by 1990 (MOS 29G/H).

In addition, data provided for all MOSs included tasks recently added to skill level 1 task list. For three MOSs (MOSs 31M, 72E/G) the data included skill level 1 tasks under development.

MOS data provided by the USASS&FG are reported in Table 13. As indicated (*), 10 of the 15 MOSs (66.7%) were judged suitable for RTUP training. As shown for the five MOSs judged not suitable for RTUP application, only MOS 29N had a majority of highly critical combat skill level 1 tasks judged suitable for RTUP application. For MOS 72G, none of the highly critical combat tasks were judged suitable.

Table 13

SME Judgments on Tasks in Signal MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
29E*	148	41	2	39	0	114.0
29J**	57	15	7	8	0	30.3
29M	91	74	39	0	0	0.0
29N	26	10	5	2	0	2.5
31C*	79	29	17	12	0	56.0
31K**	73	13	11	2	0	2.5
31L**	41	4	4	0	0	0.0
31M**	83	83	83	0	0	0.0
31Q	25	25	15	0	0	0.0
31V*	83	36	19	17	0	65.0
36L	47	14	3	0	0	0.0
36M**	23	8	7	1	0	.4
39T**	37	15	15	0	0	0.0
72E*	25	25	0	23	2	54.5
72G	43	11	0	0	1	0.0

*Suitable for RTUP application.

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

As also indicated (**) in Table 13, 6 of the 10 MOSs judged suitable for RTUP application were judged suitable for training using training guides during the three day time frame for conducting a RTUP.

U.S. Army Soldier Support Center

The U.S. Army Soldier Support Center (USASSC) reported proponency for the following 18 MOSs:

MOS	TITLE
00E	Recruiter (Reserve Forces)
00R	Recruiter/Retention NCO
02B-02U	Bandperson (different instruments)
02Z	Bands Senior Sergeant
71C	Executive Administrative Assistant
71D	Legal Specialist
71E	Court Reporter
71L	Administrative Specialist
73C	Finance Specialist
73D	Accounting Specialist
73Z	Finance Senior Sergeant
75B	Personnel Administration Specialist
75C	Personnel Management Specialist
75D	Personnel Records Specialist
75E	Personnel Action Specialist
75F	Personnel Information System Management Specialist
75Z	Personnel Sergeant
79D	Reenlistment NCO (Reserve Forces Only)

Eight of the 18 MOSs listed above (MOSs 00E, 00R, 02Z, 71E, 73Z, 75Z, 79D) were excluded by the USASSC for RTUP analysis because the MOSs did not have skill level 1 tasks.

MOS data provided by the USASSC are reported in Table 14. As indicated (*), all 10 of the MOSs (100%) were judged suitable for training following the RTUP methodology. As also shown (**), 6 of these 10 MOSs were also judged suitable for training the highly critical combat tasks within the MOSs using training guides during the USATB time frame for conducting a RTUP.

For MOSs in which no training material was required (MOSs 71C/D,75B), the SMEs indicated that either procedure guides or training guides would be preferable. For three MOSs (MOSs 71D, 75B, 75F) the SMEs indicated that both procedure guides and training guides were suitable for training the tasks.

Table 14

SME Judgments on Tasks in Soldier Support MOSs

MOS	Skill level 1 tasks	Combat critical tasks	Suitable for training using: Procedure guide	Training guide	No material	Training time (hrs)
71C**	30	23	0	13	10	28.0
71D**	31	10	10[a]	10[a]	6	21.0
71L**	20	12	8	3	1	7.0
73C**	28	28	0	28	0	35.0
73D*	23	12	0	12	0	61.0
75B*	40	12	12[a]	12[a]	4	76.0
75C**	38	11	3	8	3	35.0
75D*	38	26	5	21	0	57.0
75E**	39	27	9	18	0	35.0
75F*	45	10	10[a]	10[a]	0	50.0

*Suitable for RTUP application.

**Suitable for RTUP and can be conducted during a three day time frame with 10-12 hours per day.

[a]Tasks could be trained using both a procedure guide and training guide.

Summary

Table 15 presents a cumulative summary of the detailed analysis of enlisted MOSs by SMEs for RTUP application by the 14 U.S. Army service schools. As shown, the SMEs analyzed 142 (79.3%) of the MOSs for which the schools were the proponent. Subsequently, 103 (72.5%) of the total MOSs analyzed were judged by the SMEs as suitable for RTUP training. Of these MOSs, 76 (73.8%) were judged trainable using training guides during the three day RTUP training period.

DISCUSSION

The purpose of this research was to to identify enlisted U.S. Army Military Occupational Specialties (MOSs) within the U.S. Army service schools that were suitable for training Individual Ready Reserve (IRR) soldiers following a Rapid Train-up Program (RTUP) methodology. The specific objectives of the research were to (a) determine tasks at skill level 1 for each MOS that were highly critical for combat, (b) determine which highly critical combat tasks were suitable for training IRR soldiers in a RTUP using a procedure guide, a training guide, or no training materials, and (c) determine the average time required to provide refresher training for an IRR soldier on each highly critical combat task to standard using a training guide.

Table 15

Summary of MOSs Suitable for RTUP Application by U.S. Army Service Schools

Service schools	Number proponent MOS	Number MOSs analyzed	Number MOSs suitable	Number RTUP suitable
Air Defense	14	14	8	8
Armor	3	3	3	0
Aviation	5	5	5	5
Chaplain	1	1	0	0
Chemical	1	1	0	0
Engineer	21	19	18	16
Field Artillery	13	13	8	4
Infantry	4	4	1	1
Intelligence	19	18	3	TBD
Military Police	3	1	1	1
Ordnance	25	25	25	24
Quartermaster	13	13	11	5
Signal	39	15	10	6
Soldier Support	18	10	10	6
TOTALS	179	142	103	76

Under the conditions prevailing in this research, however, few firm unqualified inferences can be drawn from the information obtained. First, the data provided by the service schools is based on the consensus judgments of three SMEs, sometimes less, for each MOS. Although cursory inspection of the data indicates moderate to high interrater agreement, the reliability of the SME judgments remains statistically undetermined. In general, such research would have required a greater number of SMEs with similar background and experience in the MOS. Given the service schools current workloads and shortage of personnel available to them, such a requirement would have been impossible for them to meet.

Secondly, the SMEs were instructed to identify from a list of skill level 1 tasks for a given MOS those tasks they considered highly critical for combat. Some of the service schools, since they already had a documented and approved critical task list for the MOS, instructed their SMEs to use this list to begin the detailed analysis for RTUP application. To them, all of the critical tasks were highly critical for combat. At most other service schools, however, SMEs were provided the critical task list and subsequently determined which of those tasks were highly critical for combat. It becomes quite apparent, therefore, that the approach used by the different service schools affects the final outcome of the research on which MOSs are suitable for RTUP application. MOSs which have fewer highly critical combat tasks

to consider would tend to be more suitable for RTUP than those with greater number of such tasks.

A possible solution to this problem of task criticality is pending. Currently, TRADOC has an initiative underway to determine those collective tasks in unit Army Mission Training Plans (AMTPs) that are essential to the accomplishment of the most important doctrinal missions. Once this has been accomplished, analysis of the collective tasks should enable units to identify those individual tasks that are highly critical for combat. Analysis of these data in terms of the specific needs of the IRR should provide the IRR units with a hierarchy of training requirements identifying those tasks that should be trained to standard during the limited amount of mobilization training time available to them.

Thirdly, SMEs were instructed to estimate for each highly critical combat task judged to be trainable using a training guide, the time necessary to complete refresher training with the average IRR soldier. In making their time estimates, they were to be informed that the average IRR soldier was previously qualified in the MOS at skill level one and has a two to four year military obligation remaining. In looking at the data, however, a wide disparity of time estimates is evident across SMEs. Moreover, the SME consensus data is usually an average of the SMEs estimates. This is quite obvious when only two SMEs provided time estimates. Apparently, not everyone of the SMEs received the same instructions on how to complete this part of the analysis.

Despite these limitations, the data provided by the U.S. Army service schools SMEs provide useful indications on the suitability of the RTUP methodology for IRR mobilization training in enlisted MOSs. The more immediate use of the data can be used to supplement ongoing efforts within TRADOC to develop and document an IRR training strategy for the future, and in formulating requirements for IRR mobilization training. Given current technology and that which will become available in the near future, it should be possible to develop a computer-based system that can diagnose individual soldier skill level proficiency and prescribe the required training to the level required for any given position. These research findings, therefore, provide an important data base for hypotheses that can be followed up in later research on RTUP application. If successful, the overall effectiveness of the IRR can be maximized while minimizing the costs of preparing IRR soldiers for combat.

CONCLUSIONS

The major findings of this research are summarized below:

1. 103 of 142 U.S. Army enlisted MOSs (72.5%) analyzed by SMEs from 14 U.S. Army service schools were judged suitable for training Individual Ready Reserve (IRR) soldiers in skill level 1

tasks rated highly critical for combat following a Rapid Train-up Program (RTUP) methodology.

2. 76 of these 103 U.S. Army enlisted MOSs (73.8%) could be trained following the RTUP methodology during a 36 hour, 10-12 hour per day time frame being considered by the USATB for conducting a RTUP.

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Message, Cdr, TRADOC, ATDC-T, 202000Z Jul 88. Subject: Rapid Train-up Detailed MOS Study.

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Obrien, R. E., Crum, W. J., Healy, R. D., Harris, J. H., & Osborn, W. C. (1977). Trial implementation of the tank crewman skills training program (TCST) (ARI Technical Report TR-78-A29). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A061 226)

APPENDIX A

ARI MEMORANDUM FOR DETAILED ANALYSIS OF U.S. ARMY MILITARY OCCUPATIONAL SPECIALTIES (MOS) FOR RAPID TRAIN-UP APPLICATION

PERI-IK (70-1r) 19 August 1988

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Detailed Analysis of U.S. Army Military Occupational Specialties (MOSs) for Rapid Train-up Application

1. Purpose. The Deputy Commanding General for Training (DCGT) at the Training and Doctrine Command (TRADOC) has directed the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to identify Military Occupational Specialties (MOSs) that can be trained following a Rapid Train-up Program (RTUP) methodology. To successfully accomplish this project, TRADOC has directed the proponent service schools to fully cooperate with ARI by providing a Point of Contact (POC) and subject matter experts (SMEs) for each MOS, and requested literature. The purpose of this memorandum is to provide background information concerning the project, identify the specific requirements to be met by the proponent schools, and present detailed instructions to personnel designated by the schools to accomplish the requirements.

2. Background Information.

a. Given the ongoing reductions in funds available, TRADOC is in the process of developing an Individual Ready Reserve (IRR) training strategy. This strategy is intended to maximize the effectiveness of the IRR in the event of a mobilization, while minimizing the costs of preparing IRR soldiers for combat. All soldiers in the IRR have served on active duty and are still obligated by law to be available for military duty. Based on data summarized in a recent RAND report, 85% of the Army members of the IRR have been trained only to skill level one, and most have a two to four year obligation remaining. Given the circumstance that the great majority of these soldiers have never been trained to high levels of mastery in their combat skills, and several years may have passed between entry in the IRR and a call-up, any training strategy that is developed must ensure that the best use is made of the IRR personnel during mobilization. One principal training approach being considered as part of an overall IRR training strategy is the development of Rapid Train-up Programs (RTUPs).

b. The RTUP approach is based on recognition of the fact that tasks that are moderately easy to learn may be refreshed or relearned quickly, while other tasks are so difficult to learn or error prone that they should not be performed by memory alone.

PERI-IK
SUBJECT: Detailed Analysis of U.S. Army Military Occupational Specialties (MOSs) for Rapid Train-up Application

This approach concentrates on the highly critical tasks that must be taught for safety and rapid availability in combat, as compared to tasks that may be reacquired gradually by on-the-job training (OJT). RTUPs are designed to be administered as self-paced individualized instruction or as instructor-led task training. Training may be designed for administration in CONUS training centers or in Active Component (AC) and Reserve Component (RC) units.

c. A RTUP consists of two types of training materials: procedure guides and training guides. A procedure guide is a job performance aid designed to help experienced soldiers -- soldiers with previous training on tasks in their MOS -- to remember and perform a number of lengthy and complex task procedures. The guide can be used by the soldier for self-paced review, and provides a compact, readily available reference source whenever needed. To accomplish this, a procedure guide abbreviates task information and presents it in an innovative algorithmic format similar to a flow chart diagram. At each decision point, a soldier is asked a question concerning the phase of operation, environmental conditions, status of lights or switches, etc. Based upon the soldier's answer, the appropriate succeeding steps are identified. An example of a procedure guide is presented in Enclosure 1.

d. A training guide is a compact, ready-made instructional module or unit that provides a best method for training and evaluating a particular job task. Each training guide is formatted on a single page. The front side contains a brief description of the training task, a training pretest procedure, a training decision guide and prescription, and a training progress procedure. The back side of a training guide contains a training and evaluation checklist. When demonstrating a task, the checklist can be used by an instructor as a reminder of the task procedure. When directing the practice of a task, it can be used by the instructor to guide initial task performance, correct errors, and check training progress. An example of a training guide is presented in Enclosure 2.

e. The RTUP also contains a short list of critical but very simple tasks that don't require the use of either a procedure guide or a training guide. For example, identifying 120mm main gun ammunition for the M1A1 tank. Performance of this kind of task can be easily checked and refreshed by the soldier's immediate supervisor without training materials.

3. Specific Requirements. The Point of Contact (POC) designated at each proponent service school is asked to provide ARI with the following products:

a. An official list of MOSs for which the proponent service school has primary responsibility.

b. An official list of tasks at skill level one for each MOS that the proponent service school has primary responsibility.

c. A SME generated list of all tasks at skill level one for each MOS that are considered "highly critical for combat."

d. For the list of highly critical combat tasks at skill level one for each MOS, a record of SME judgments on the suitability of tasks for rapid train-up using a procedure guide.

e. For the list of highly critical combat tasks at skill level one for each MOS, a record of SME judgments on the suitability of tasks for rapid train-up using a training guide.

f. For highly critical combat tasks at skill level one for each MOS that were identified as suitable for rapid train-up using a training guide, a record of SME estimates of average time to train each task to standard.

g. For the list of highly critical combat tasks at skill level one for each MOS, a record of SME judgments on tasks that should be part of a rapid train-up program but do not require training materials.

4. Detailed Instructions. To meet these specific requirements, each POC is asked to obtain the services of three SMEs for each MOS that the service school has primary responsibility. When this has been done, follow the approach provided in the remaining paragraphs.

a. Obtain an official list of MOSs for which the proponent service school has primary responsibility. This list should be readily available from personnel in the school's Directorate of Training and Doctrine (DOTD).

b. Obtain an official list of tasks at skill level one for each MOS for which the proponent service school has primary responsibility. This list should be readily available from personnel in the school's Directorate of Training and Doctrine (DOTD).

c. Develop an SME generated list of tasks at skill level one for each MOS that are considered "highly critical combat tasks." This list may be available from personnel in the school's Directorate of Training and Doctrine (DOTD) as the Mission Essential Task List (METL). If not, meet this requirement by using the following approach:

PERI-IK
SUBJECT: Detailed Analysis of U.S. Army Military Occupational Specialties (MOSs) for Rapid Train-up Application

(1) Provide the list of tasks at skill level one for a given MOS to each SME. Instruct each SME to use one of the following criteria to independently select those tasks that he considers "highly critical combat tasks:"

(a) Tasks for soldiers in combat arms units that are essential for accomplishment of the units' missions.

(b) Tasks for soldiers in combat support units that are essential for accomplishing the units' support missions.

(c) Tasks for soldiers in service support units that are essential to sustaining the supported units' capabilities to accomplish its missions.

(2) After each SME has completed selecting what he considers to be the highly critical combat tasks, have the three SMEs meet as a group to resolve any differences that may exist among them. The result of this effort will be a consensus decision on the combat criticality of each task.

(3) With the list of tasks at skill level one for a given MOS, show the judgments of the SMEs in four columns. Use an "X" to indicate tasks initially selected by SMEs 1, 2, and 3, and the final consensus selections.

(4) Repeat this procedure for each of the remaining MOSs that the proponent service school has primary responsibility.

d. For the list of highly critical combat tasks at skill level one for each MOS, develop a record of SME judgments on the suitability of tasks for rapid train-up using a procedure guide. To meet this requirement, use the following approach:

(1) Provide the list of highly critical combat tasks at skill level one for a given MOS to each SME. Instruct each SME to use the following criteria to independently select those tasks that he considers suitable for rapid train-up using a procedure guide:

(a) Task is procedural in that it consist of sequences of distinct steps, actions, or elements.

(b) Task performance requires remembering the correct step from a large group of possible steps (e.g., what control knob to turn and in what order (what to do next) rather than how to turn the knob (how to do it).

(c) Task performance requires making several alternative decisions rather than following a simple, straight forward procedure.

(d) Task is difficult to learn, error prone, and should not be performed from memory.

(2) After each SME has completed selecting highly critical combat tasks at skill level one for a given MOS as suitable for rapid train-up using a procedure guide, have the SMEs meet as a group to resolve any differences that may exist among them. The result of this effort will be a consensus decision on the combat critical tasks suitable for rapid train-up using a procedure guide.

(3) With a list of highly critical combat tasks at skill level one for a given MOS, show the judgments of the SMEs in four columns. Use an "X" to indicate tasks initially selected by SMEs 1, 2, and 3, and the final consensus selections.

(4) Repeat this procedure for each of the remaining MOSs that the proponent service school has primary responsibility.

e. For the list of highly critical combat tasks at skill level one for each MOS, develop a record of SME judgments on the suitability of tasks for rapid train-up using a training guide. To meet this requirement, use the following approach:

(1) Provide the list of highly critical combat tasks at skill level one for a given MOS to each SME. Instruct each SME to use the following criteria to independently identify those tasks he considers suitable for rapid train-up using a training guide:

(a) Task is procedural in that it consists of sequences of distinct steps, actions, or elements.

(b) Task can be relearned in a reasonable time and is remembered well (for at least a month or so) once trained.

(c) Task is time pressured and usually must be performed by memory, without reference to a manual.

(d) Task must be remembered without prompting, and performed correctly for safety of personnel, or to avoid damage to equipment.

(2) After each SME has completed selecting highly critical combat tasks that he considers suitable for rapid train-up using a training guide, have the three SMEs meet as a group to

resolve any differences that may exist among them. The result of this effort will be a consensus decision on the combat critical tasks suitable for rapid train-up using a training guide.

(3) With the list of highly critical combat tasks at skill level one for a given MOS, show the judgments of the SMEs in four columns. Use an 'X' to indicate tasks initially selected by SMEs 1, 2, and 3, and the final consensus selections.

(4) Repeat this procedure for each of the remaining MOSs that the proponent school has primary responsibility.

f. For the list of highly critical combat tasks at skill level one for each MOS that were identified as suitable for rapid train-up using a training guide, develop a record of SME estimates of the average time to train each task to standard. To meet this requirement, use the following approach:

(1) Provide a list of highly critical combat tasks that were considered suitable for rapid train-up using a training guide for a given MOS to each SME. Instruct each SME to independently estimate for each task the time he thinks would be necessary to complete refresher training using a training guide with the average IRR soldier.

(2) After each SME has completed estimating training time for each task, have the three SMEs meet as a group to resolve any differences that may exist among them. The result of this effort will be a consensus decision on the average time necessary to refresher train critical tasks suitable for rapid train-up using a training guide.

(3) With the list of highly critical combat tasks that were considered suitable for rapid train-up using a training module for a given MOS, show the time estimates of the SME in four columns. Use the first three columns for SME 1, 2, and 3, and column four for the final consensus estimates.

(4) Repeat this procedure for each of the remaining MOSs that the proponent school has primary responsibility.

g. For the list of highly critical combat tasks at skill level one for each MOS, develop a record of SME judgments on tasks that should be part of a rapid train-up program but do not require training materials. To meet this requirement, use the following approach:

(1) Provide the list of highly critical combat tasks at

skill level one for a given MOS to each SME. Instruct each SME to use the following criteria to independently identify those tasks he thinks should be part of a rapid train-up program but do not require training materials:

(a) Task has a few simple steps.

(b) Task is very easy to learn and remember for several months or more.

(c) Task can be immediately relearned after a single reminder by the supervisor.

(d) Task can be easily performed without error from memory and without using a manual.

(e) Task does not require repeated practice to keep to a time standard.

(f) Task does not involve safety or possible damage to equipment.

(2) After each SME has completed selecting highly critical combat tasks at skill level one for a given MOS that should be part of a rapid train-up program but do not require training materials, have the SMEs meet as a group to resolve any differences that might exist among them. The result of this effort will be a list of highly critical combat tasks that should be part of a rapid train-up program but do not require using training materials.

(3) With the list of highly critical combat tasks at skill level one for a given MOS that do not require training materials, show the judgments of the SMEs in four columns. Use and "X" to indicate tasks initially selected by SMEs 1, 2, and 3, and the final consensus selections.

(4) Repeat this procedure for each of the remaining MOSs that the proponent school has primary responsibility.

5. The remaining highly critical combat tasks will be tasks that require alternative training solutions, i.e., use of operational equipment, use of training devices or simulators, experience in field exercises, etc. Such tasks are considered unsuitable for a RTUP.

6. These products should be completed and forwarded to ARI NLT 23 September 1988. Forward products to: Chief, USARI Field Unit-Ft Knox, ATTN: PERI-IK (Mr. Ron Kraemer), Fort Knox, KY 40121-5620.

PERI-IK
SUBJECT: Detailed Analysis of U.S. Army Military Occupational Specialties (MOSs) for Rapid Train-up Application

7. Telephone acknowledgement of receipt of this memorandum is requested with Mr. Kraemer at AV 464-2613/4932 or COMM (502) 624-2613/4932.

2 Encls

DONALD F. HAGGARD
Chief

DISTRIBUTION:

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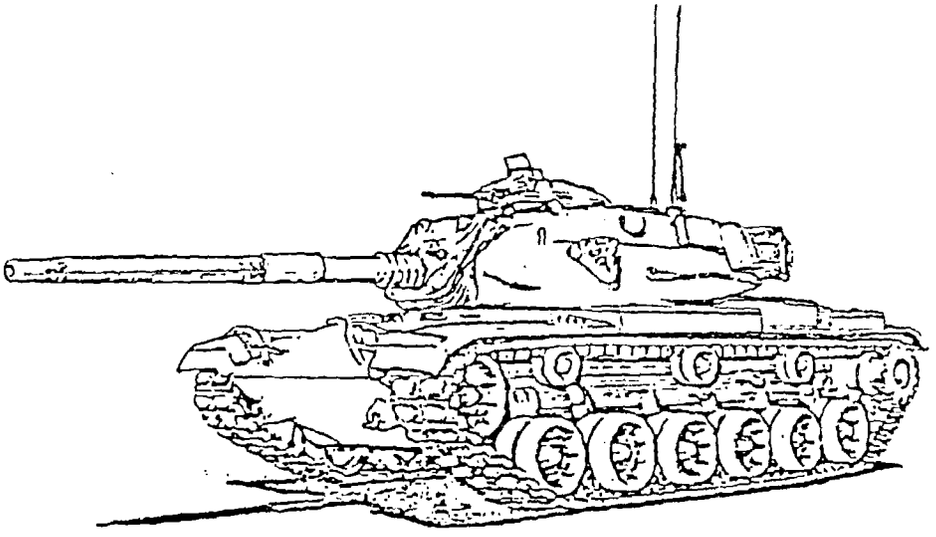
PROCEDURE GUIDE

M60A3 TANK



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FOR THE

BEHAVIORAL AND SOCIAL SCIENCES

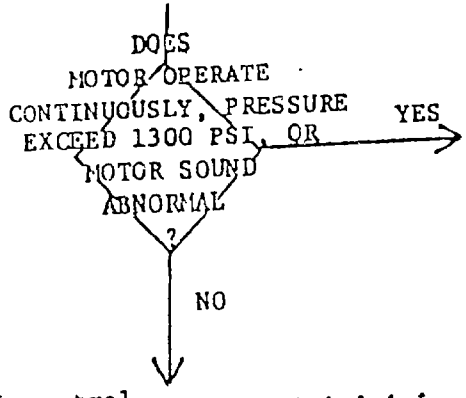
OPERATIONAL RESPONSE TEST:
(TM PAGE 2-258)

RATE TACHOMETER AND LEAD CIRCUITRY

1. MODE on LRF . . . . . TEST (TC)
2. MASTER BATTERY . . . . . ON (driver)
3. POWER on gunner's control unit . . . . . ON
4. MANUAL/RANGEFINDER . . . . . MANUAL
5. RANGE METERS X100 20
6. CROSSWIND AUTO/MANUAL . . . . MANUAL
7. CROSSWIND MPH . . . . . 0 MPH
8. MOVING/STATIONARY STATIONARY
9. HEAT switch . . . . . Depress

Heat switch should become brighter than other three

GO TO 10

17. 

17a. Organizational . . . Notify maintenance

18.	RTCL control	Adjust until reticle is visible
19.	Turret	Hold steady
20.	Palm switch	Depress/hold
21.	Thumb switch	Momentarily depress
22.	Reticle	Should not move
23.	Gunner's palm switch	Release/depress
24.	Turret	Slew turret to the right at medium speed
25.	Thumb switch	Momentarily depress
26.	Reticle	Should jump to the left

GO TO 27

36. HAVE RETICLES/CONTROLS BEEN CHECKED IN STAB MODE ? — YES → GO TO 50

NO ↓

37. MOVING/STATIONARY switch on gunner's unit . . . . . MOVING — MOVING should illuminate on both units

WHEN STABILIZATION SYSTEM IF FIRST ENGAGED, TURRET OR GUN MOVEMENT MAY OCCUR. DURING STABILIZED OPERATIONS, MOVEMENT OF THE GUNNER'S CONTROL HANDLES WILL CAUSE TURRET AND GUN MOVEMENT EVEN THOUGH THE PALM SWITCHES ARE NOT DEPRESSED.

38. STAB ELECTRONICS . . . . . ON (TC)

39. POWER PACK BLOWER MOTOR . . . . . ON (TC)

↓

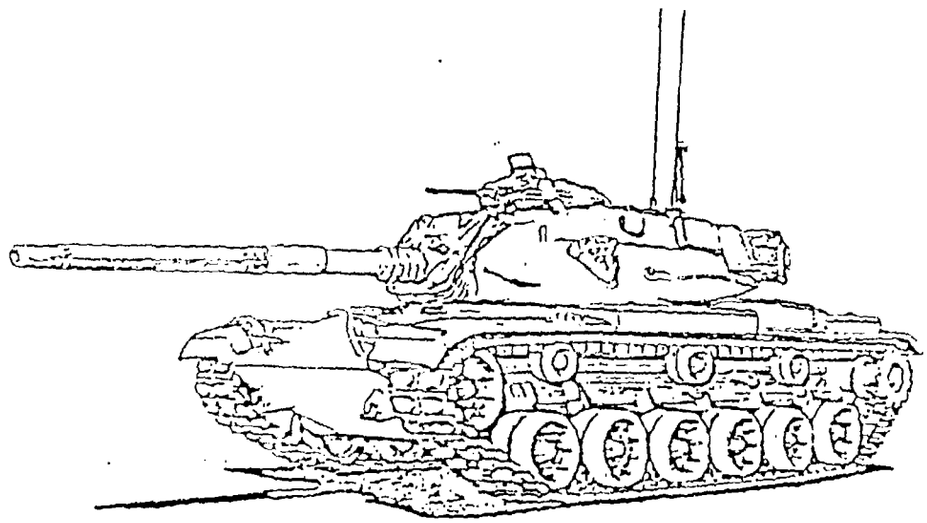
GO TO 40

45.	TRAV BALANCE knob	Rotate counterclockwise until drift occurs/ note position
46.	TRAV BALANCE knob	Set halfway between first and second position
47.	ELEV BALANCE knob	Rotate clockwise until drift occurs/note position
48.	ELEV BLANCE knob	Rotate counterclockwise until drift occurs/ note position
49.	ELEV BALANCE knob	Set halfway between first and second position

50.	POWER on stabilization control selector	OFF

TRAINING GUIDE

M60A3 TANK LOADER



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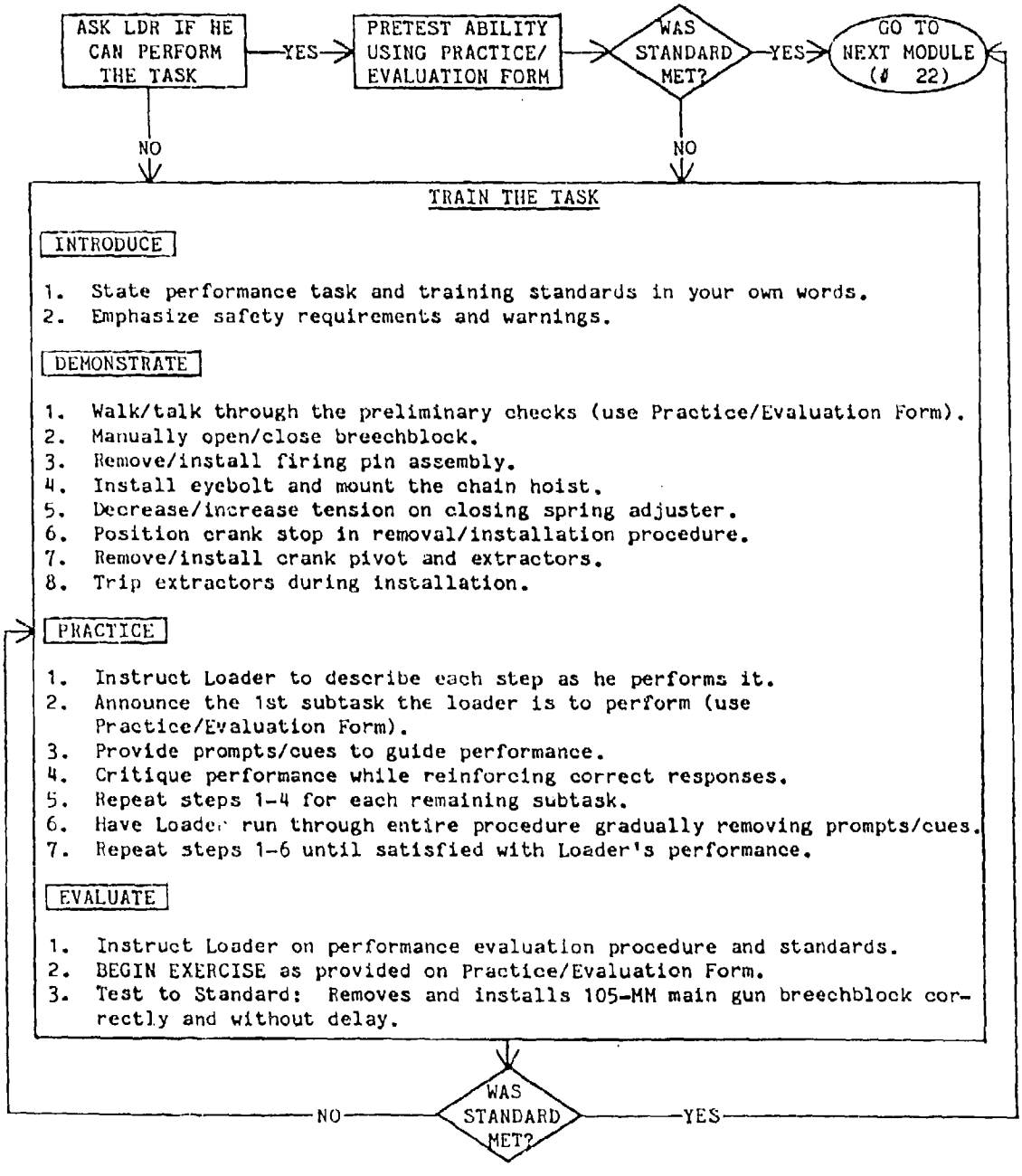
CREW POSITION: LOADER TRAINING MODULE NO: 21
TASK: REMOVE/INSTALL 105-MM MAIN GUN BREECHBLOCK. TIME: 30 MINUTES
PREREQUISITE TASKS: OPEN/CLOSE 105-MM MAIN GUN BREECHBLOCK MANUALLY.
TRAINING REFERENCES: TM 9-2350-253-10; FM 17-19 E1/2; FK-ARS-15-79 (020-171-9043B); FK 14-79 (020-171-9044B).
SUPPORT REQUIREMENTS: 1 M60A3 TANK OR TURRET TRAINER; 1 CHAIN HOIST; 4X6 INCH WOOD BLOCK; 1 EYEBOLT; 1 SPANNER-WRENCH; 1 SCREWDRIVER.



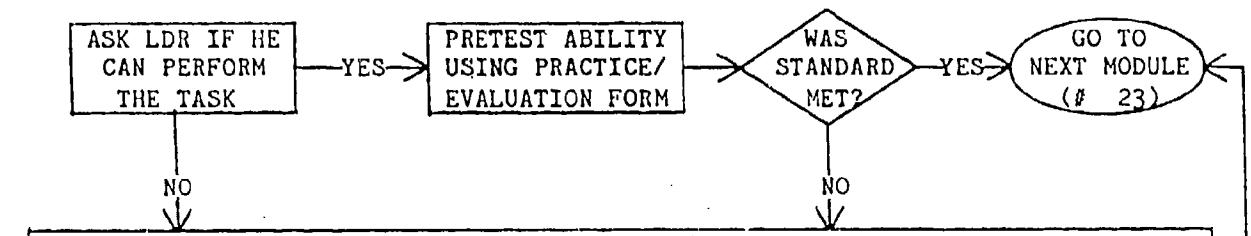
CREW POSITION: LOADER — TRAINING MODULE NO: 22

TASK: DISASSEMBLE/ASSEMBLE THE 105-MM MAIN GUN BREECHBLOCK. — TIME: 30 MINUTES

PREREQUISITE TASKS: REMOVE 105-MM MAIN GUN BREECHBLOCK.

TRAINING REFERENCES: TM 9-2350-253-10; FM 17-19 E1/E2; DAMP/TVPP #10959 TF 17-4651 USATRADOC.

SUPPORT REQUIREMENTS: 1 M60A3 TANK OR TURRET TRAINER; 1 BREECHBLOCK MECHANISM; 1 STOPWATCH; 1 SCREWDRIVER.



TRAIN THE TASK

INTRODUCE

1. State performance task and training standards in your own words.
2. Emphasize safety requirements and warnings.

DEMONSTRATE

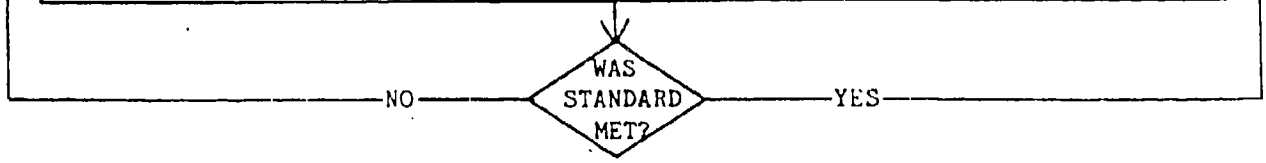
1. Align the arrows for removal and installation of firing contact assembly.
2. Remove firing contact assembly, pointing out location of firing contact plate plunger.
3. Lay out each part removed for later installation.
4. Remove driver assembly, pointing out position of clamp ("NOTCH" up).
5. Install driver assembly and firing contact assembly.

PRACTICE

1. Instruct Loader to describe each step as he performs it.
2. Announce a subtask (use Practice/Evaluation Form).
3. Provide prompts/cues to guide performance.
4. Critique performance while reinforcing correct responses.
5. Repeat steps 1-4 for each remaining subtask.
6. Have Loader run through entire procedure gradually removing prompts/cues.
7. Repeat steps 1-6 until satisfied with Loader's performance.

EVALUATE

1. Instruct Loader on performance evaluation procedure and standards.
2. BEGIN EXERCISE as provided on Practice/Evaluation Form.
3. Test to Standard: Disassembles and assembles the 105-MM Main Gun breech-block correctly and without delay.



APPENDIX B

LIST OF U.S. ARMY SERVICE SCHOOLS AND POINTS OF CONTACT (POC)

U.S. ARMY SERVICE SCHOOL	POINT OF CONTACT
AIR DEFENSE ARTILLERY SCHOOL	MR. PAT SYSKA
ARMOR SCHOOL	MR. ED CARBERRY
AVIATION CENTER	MR. DONALD FUNKHOUSER
CHAPLAIN CENTER AND SCHOOL	MR. FRANK SPANG
CHEMICAL SCHOOL	MRS. JEAN WELLS
ENGINEER SCHOOL	LTC CHARLES DOLL
FIELD ARTILLERY SCHOOL	CPT Megia
INFANTRY SCHOOL	MS. JERRY COLLINS
INTELLIGENCE CENTER AND SCHOOL	MR. DENNIS MITCHELL
INTELLIGENCE SCHOOL	CPT DRU BRENNER-BECK
MILITARY POLICE SCHOOL	MR. RICHARD HARRISON
ORDNANCE CENTER AND SCHOOL	SSG JUNGKUNTZ
QUARTERMASTER SCHOOL	MRS. JOYCE MASSENBURG
SIGNAL SCHOOL AND FT GORDON	MR. JOHN LUEHRSEN
SOLDIER SUPPORT CENTER	MRS. GAIL MYER